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EXAMINER	
MEW, KEVIN D	

ART UNIT	PAPER NUMBER
2616	

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/730,649	SCHERZER ET AL.	
	Examiner	Art Unit	
	Kevin Mew	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14-27,29-34,37-49,51-54,57-59,61,62 and 64-69* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *52-54,57-59,61,62 and 64-69* is/are allowed.

6)☒ Claim(s) *1-12,14-27,31-34,39-49 and 51* is/are rejected.

7)☒ Claim(s) *29,30,37 and 38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Response to Amendment

1. Applicant's Remarks/Arguments filed on 12/1/2005 have been considered. Claims 13, 28, 35-36, 50, 55-56, 60, 63 have been canceled by applicant. Claims 1-12, 14-27, 29-34, 37-49, 51-54, 57-59, 61-62, 64-69 are currently pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-12, 14-27, 31-34, 39-49, 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laroia et al. (US Publication 2005/0073973) in view of Kubler et al. (US Publication 2005/0254475 A1).

Regarding claim 1, Laroia discloses a method for providing wireless communication (**multi-sector, multi-cell communications system**, see paragraph 0017 and Fig. 1), said method comprising:

providing a plurality of frequency channels (**different communication channels**, see paragraph 0026) in each of a plurality of portions (see sectors 1, 2, 3, 4, Fig. 1) of a service area (see element 100, Fig. 1), wherein a same frequency channel of said plurality of frequency channels is provided for use in two or more adjacent portions of said service area (**frequency reuse is achieved in all sectors**, see entire paragraphs 0024, 0025); and

mitigating interference by making particular channels of said plurality of channels available for use by network nodes disposed in said portions of said service area based upon dynamically determined communication link metrics (**the classification of types of information and types of channels may be flexible and may be changed dynamically based on the system overall loading and user required data rate in order to provide different tolerable interference**, see paragraphs 0009 and 0033).

Laroia does not explicitly disclose the plurality of channels are provided in an unlicensed frequency band.

However, Kubler discloses a wireless communication method comprising an unlicensed frequency band of 27 MHz under which radio units operate (see paragraph 0380).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of providing a plurality of frequency channels of Laroia with the teaching of Kubler in employing the unlicensed frequency band for operating radio units. The motivation to do so is that 27 MHz utilizes low power that is capable of reliably transferring information at a range of approximately 40 to 100 feet asynchronously at 19.2 kbps and also does not require FCC licensing.

Regarding claim 2, Laroia discloses the method of claim 1, wherein said mitigating interference comprises:

selecting a channel from said plurality of channels for communication with a particular network node (**network node 136**, Fig. 1) using adaptive dynamic channel selection to identify a channel having a best communication attribute with respect to said network node

(types of channels may be flexible and may be changed dynamically based on the system overall loading and user required data rate in order to provide different tolerable interference, see paragraphs 0009 and 0033).

Regarding claim 3, Laroia discloses the method of claim 1, wherein said mitigating interference further comprises:

selecting a time division of said particular channels for use in communicating with particular network nodes based upon said dynamically determined communication link metrics (**each channel segment includes a determined duration of time**, see paragraph 004).

Regarding claim 4, Laroia discloses the method of claim 1, wherein said mitigating interference comprises:

selecting at least two channels from said plurality of channels for communication with a particular network node such that transmission of identical data on said at least two channels is provided for post data selection (see paragraphs 0028, 0029, 0041).

Regarding claim 5, Laroia discloses the method of claim 1, wherein said mitigating interference comprises:

selecting at least two channels from said plurality of channels for communication with a particular network node such that data is divided for transmission on said at least two channels for time/frequency coding (**two different types of channels for two different types of coding**, see paragraphs 0028, 0029).

Regarding claim 6, Laroia discloses the method of claim 1, wherein said mitigating interference comprises:

limiting transmission duty cycles of network nodes with respect to each active channel of said plurality of channels (**each channel is scheduled to transmit for a determined period of duration time**, see paragraph 0044).

Regarding claim 7, Laroia discloses the method of claim 1, wherein said dynamically determined communication link metrics comprise interference level information (**allowable user bit error rate**, see paragraph 0033).

Regarding claim 8, Laroia discloses the method of claim 1, wherein said dynamically determined communication link metrics comprise signal propagation level information (**user required data rate**, see paragraph 0033).

Regarding claim 9, Laroia discloses the method of claim 1, wherein said dynamically determined communication link metrics comprise traffic load information (**system overall loading**, see paragraph 0033).

Regarding claim 10, Laroia discloses the method of claim 1, wherein said dynamically determined communication link metrics comprise quality of service information (**user priority**, see paragraph 0033).

Regarding claim 11, Laroia discloses the method of claim 1, further comprising:

selecting network nodes for simultaneous use of said particular channels as a function of spatial characteristic groupings of said network nodes (**selecting nodes EN(1), EN(X), and so on in Fig. 1 for simultaneous use of the first type of communication channel depends on which sector the network nodes are located**, see paragraphs 0027, 0028, 0029 and Fig. 1).

Regarding claim 12, Laroia discloses the method of claim 1, wherein said each said frequency channel of said plurality of frequency channels (**first type, second type, and third type of communication channels**, see paragraphs 0027, 0028, 0029) is provided for use in all portions (**all sectors**) of said service area (see Fig. 1).

Regarding claim 14, Laroia discloses the method of claim 1, wherein said mitigating interference comprises assigning a different channel of said plurality of channels for use by a particular network node in an uplink and a downlink (see paragraph 0034).

Regarding claims 15, 19, Laroia discloses a wireless communication network system comprising:

a plurality of communication sectors of a service area (see sectors 1, 2, 3, Fig. 1), wherein each communication sector has a plurality of channels associated therewith (**each sector has first type, second type and third type of communication channels**, see paragraphs 0027, 0028, 0029), and wherein adjacent ones of said communication sectors have at least one same

channel of said plurality of channels associated therewith (**second type of communication channel will be used where some of the utilized tones allocated to the adjacent sectors to transmit information**, see paragraph 0028), and channel management control apparatus (base station 200, see Fig. 2) making particular channels of said plurality of channels available for use by network nodes of said network system as a function of external interference experienced with respect to one or more channels of said plurality of channels (**types of information and types of channels to use depends on the allowable user bit error rate**, see paragraph 0033), wherein the channel management control apparatus implements at least two tier channel scheduling strategy (**the scheduler module allocates a symbol transmission time period for the frequency spectrum 502, and one or more logical tones for a determined duration of time**, paragraphs 0044 and 0059 and Fig. 5).

Regarding claim 16, Laroia discloses the system of claim 15, wherein said channel management control apparatus makes particular time divisions within said particular channels available for use by said network nodes as a function of dynamically determined channel conditions (see paragraphs 0033 and 0044).

Regarding claim 17, Laroia discloses the system of claim 15, wherein each channel of said plurality of channels is provided in each communication sector of said plurality of communication sectors (see paragraphs 0027, 0028, 0029 and Fig. 1).

Regarding claim 18, Laroia discloses the system of claim 17, wherein said plurality of channels comprise at least 3 frequency channels (**three types of communication channels**, see paragraphs 0027, 0028, 0029).

Regarding claim 20, Laroia discloses the system of claim 15, wherein said plurality of communication sectors comprise communication sectors of a multi-sectored base station (see multi-sectored base station, Fig. 1).

Regarding claim 21, Laroia discloses the system of claim 15, wherein said plurality of communication sectors comprise communication sectors of a plurality of base stations (**base stations**, see paragraphs 0037 and 0038).

Regarding claim 22, Laroia discloses the system of claim 15, wherein said channel management control apparatus (**base station 200**) is disposed in a central configuration with respect to a plurality of base stations of said communication network (see paragraphs 0037, 0038 and Fig. 2).

Regarding claim 23, Laroia discloses the system of claim 15, wherein said channel management control apparatus (**base station 200**) is disposed in a distributed configuration with respect to a plurality of network nodes of said communication network (**base station is coupled to other base stations via the I/O interface 208**, see paragraphs 0037 and 0038).

Regarding claim 24, Laroia discloses the system of claim 15, wherein said channel management control apparatus makes at least 2 channels of said plurality of channels available for use simultaneously by a particular network node to mitigate said external interference (**first type, second type, and third type of communication channels**, see paragraphs 0027, 0028, 0029).

Regarding claim 25, Laroia discloses the system of claim 24, wherein said at least 2 channels transmit identical data simultaneously (**full tone reuse in the third type of communication channel in each of the adjacent sectors**, see paragraph 0029).

Regarding claim 26, Laroia discloses the system of claim 24, wherein said at least 2 channels transmit different portions of an information communication (see paragraph 0020).

Regarding claim 27, Laroia discloses the system of claim 15, wherein said channel management control apparatus makes at least a first channel of said plurality of channels available for use by a particular network node (**first type of communication channel is available for use)** and makes at least a second channel of said plurality of channels available for use by said particular network node (**a second type of communication channel is available for use**, see paragraphs 0027, 0028) to mitigate said external interference.

Regarding claim 31, Laroia discloses the system of claim 28, wherein a first tier of said channel scheduling strategy assigns transmission time period opportunities to communication network base station nodes to support groups of subscriber station nodes (see paragraph 0044).

Regarding claim 32, Laroia discloses the system of claim 31, wherein a second tier of said channel scheduling strategy assigns transmission time periods among subscriber station nodes of said groups of subscriber station nodes (**scheduler module assigns determined time duration to each channel segment to the wireless terminal**, see paragraph 0044).

Regarding claim 33, Laroia discloses the system of claim 15, wherein said channel management control apparatus makes a different channel of said plurality of channels available for use by a particular network node in an uplink and a downlink (see paragraphs 0027, 0028, 0029 and 0034).

Regarding claim 34, Laroia discloses a method for providing wireless communication, said method comprising:

providing a plurality of frequency channels (**different communication channels**, see paragraph 0026) in each of a plurality of portions (see sectors 1, 2, 3, 4, Fig. 1) of a service area (see element 100, Fig. 1), wherein a same frequency channel of said plurality of frequency channels is provided for use in two or more adjacent portions of said service area (**frequency reuse is achieved in all sectors**, see entire paragraphs 0024, 0025);

activating said first frequency channel in parallel with respect to said two or more adjacent portions of said service area by selecting network nodes for parallel communication links as a function of spatial characteristic groupings (**selecting nodes EN(1), EN(X), and so on in Fig. 1 for simultaneous use of the first type of communication channel depends on which sector the network nodes are located**, see paragraphs 0027, 0028, 0029 and Fig. 1);

determining a spatial signature for network nodes operable in the service area (**determining the tones being allocated for traffic channel in sector A and determining the tones being allocated for traffic channel in sector B**, paragraph 0069 and Fig. 6), wherein the network nodes selected for parallel communication links have a compatible spatial signature (**the same set of tones 1, 2, 3 are allocated for transmission in both sectors A and B**, paragraph 0069); and

determining compatibility of the spatial signatures by correspondence to a schedule of active radio vector (**determining the overlapped transmission tones by correspondence to the used tones 1, 2, and 3 in both sectors A and B**, see paragraph 0070).

Regarding claim 39, Laroia discloses the method of claim 35, wherein said activating said first frequency channel (**second type of communication channel**, see paragraph 0028) comprises:

assigning transmission time period opportunities of said first frequency channel (**second type of communication channel**, see paragraph 0028) to groups network nodes as a function of

said spatial signatures (**assigning a determined time duration for each channel segment of each sector**, see paragraph 0044).

Regarding claim 40, Laroia discloses the method of claim 34, wherein said activating said first frequency channel (**second type of communication channel**, see paragraph 0028) further comprises:

scheduling individual time slots of said first frequency channel transmission time period opportunities to particular network nodes as a function of communication demand associated with said network nodes (see paragraph 0044).

Regarding claim 41, Laroia discloses the method of claim 34, further comprising:

dynamically changing a frequency channel utilized by a particular network node based upon a determined channel quality metric (see paragraph 0033).

Regarding claim 42, Laroia discloses the method of claim 34, further comprising:

providing simultaneous transmission of a same information content using two frequency channels (see paragraph 0031); and

selecting a valid information content for use from said same information content transmitted using said two frequency channels (see paragraph 0041).

Regarding claim 43, Laroia discloses the method of claim 34, further comprising:

providing simultaneous transmission of portions of information content using two frequency channels (see paragraph 0031); and

deriving said information content by combining said portions of information content transmitted using said two frequency channels (see paragraph 0041).

Regarding claim 44, Laroia discloses the method of claim 34, wherein a second frequency channel of said plurality of frequency channels is provided in each of said two or more adjacent portions of said service area (**two or more sectors**, see paragraph 0027, 0028, 0029 and Fig. 1).

Regarding claim 45, Laroia discloses a method for providing wireless communication, the method comprising:

providing a plurality of frequency channels (**providing a plurality of frequency traffic channels**, elements 624, 654, Fig. 6) in various portions (**various sectors**, Fig. 1) of a service area (cell 102, Fig. 1), wherein a first frequency channel (**traffic channel A**, element 624, Fig. 6) of the plurality of frequency channels (**frequency traffic channels A and B**, elements 624, 654, Fig. 6) is provided in each of two or more adjacent portions of the service area (**traffic channel A** is provided in sector A of the cell, Fig. 6), wherein a second frequency channel (**traffic channel A**, element 624, Fig. 6) of the plurality of frequency channels (**frequency traffic channels A and B**, elements 624, 654, Fig. 6) is provided in each of the two or more adjacent portions of the service area (**traffic channel B is provided in sector B of the cell**, Fig. 6 and paragraph 0069); and

activating the first frequency channel in parallel (**using a set of tones 1, 2 and 3 for the first traffic channel A**, paragraph 0069) with respect to the two or more adjacent portions of the service area (**sectors A and B of the cell**) by selecting network nodes for parallel communication links as a function of spatial characteristic groupings (**selecting nodes EN(1), EN(X), and so on in Fig. 1 depending on which sector the network nodes are located**, see paragraphs 0027, 0028, 0029 and Fig. 1).

Laroia does not explicitly show the first and second frequency channels are part of an unlicensed band of frequency channels.

However, Kubler discloses a wireless communication method comprising an unlicensed frequency band of 27 MHz under which radio units operate (see paragraph 0380).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of providing a plurality of frequency channels of Laroia with the teaching of Kubler in employing the unlicensed frequency band for operating radio units. The motivation to do so is that 27 MHz utilizes low power that is capable of reliably transferring information at a range of approximately 40 to 100 feet asynchronously at 19.2 kbps and also does not require FCC licensing.

Regarding claim 46, Laroia discloses a wireless broadband access network system comprising:

a base station having a plurality of sectors (see Fig. 1), wherein each of a plurality of channels is associated with each sector of said plurality of sectors (see paragraphs 0027, 0028, 0029); and

a two-tiered scheduler (**scheduler module 226**, see Fig. 2) in communication with the base station (**base station 200**, see Fig. 2) and providing information as to channels of the plurality of channels that are to be activated in parallel with respect to assigned transmission time period opportunities (see paragraph 0044), wherein a first tier of the scheduler assigns time per group of subscriber stations (**per group of wireless terminals, e.g. EN(1'), EN(X') of sector 2**, Fig. 1) and a second tier of the scheduler assigns individual time slots within the assigned time to particular subscriber stations of the group of subscriber stations (**the scheduler module first allocates a symbol transmission time period for the frequency spectrum 502 for the wireless terminals in one of the sectors, and then one or more logical tones for a determined duration of time in each sector**, paragraphs 0044 and 0059 and Fig. 5).

Regarding claim 47, Laroia discloses the system of claim 46, further comprising:

a plurality of base stations having a plurality of sectors (**base stations 106 having sectors 1, 2 and 3**, see paragraphs 0037 and Fig. 1), wherein each of said plurality of channels is associated with each sector of said plurality of sectors (**three types of communication channels are associated with each sector**, see paragraphs 0027, 0028, 0029), and wherein said scheduler is in communication with said plurality of base stations (**scheduler module 226 of each base station**, see Fig. 2) providing information as to channels of said plurality of channels which are to be activated in parallel with respect to assigned transmission time period opportunities (**scheduler module 226 schedules uplink and downlink channels within each sector and each channel segment includes one or more logical tones for a determined duration of time**, see paragraph 0044).

Regarding claim 48, Laroia discloses the system of claim 46, wherein said base station comprises:

a plurality of wireless nodes, wherein a wireless node of said plurality of wireless nodes is associated with a sector of said plurality of sectors (**a plurality of wireless terminals and end nodes in each sector**, see paragraph 0036 and Fig. 1).

Regarding claim 49, Laroia discloses the system of claim 48, wherein said wireless nodes comprise:

an access point (**base station 106**, Fig. 1) operable according to an unlicensed wireless spectrum protocol (**CDMA**, see paragraph 0079).

Regarding claim 51, Laroia discloses the system of claim 50, wherein said groups of subscriber stations comprise subscriber stations having similar spatial attributes (**wireless terminals 144 and 146 are enclosed within the same sector**, see Fig. 1).

Response to Arguments

3. Applicant's arguments with respect to claims 1-12, 14-27, 29-34, 37-49, 51-54, 57-59, 61, 61-62, 64-69 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

4. Claims 52-54, 57-58, 59, 61, 62, 64-69 are allowed.

5. Claims 29-30, 37-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In claim 29, the system of claim 15, wherein a first tier of said channel scheduling strategy is executed centrally and a second tier of said channel scheduling strategy is executed distributedly.

In claim 30, the system of claim 15, wherein said first tier of said channel scheduling strategy updates channel assignments at a relatively slow pace and wherein said second tier of said channel scheduling strategy updates channel assignments in real-time.

In claim 37, the method of claim 34, further comprising:

weighting a plurality of schedule of active radios vectors such that a heaviest weighted schedule of active radios vectors provides for a highest number of parallel communication links, wherein said plurality of schedule of active radios vectors comprises said schedule of active radios vector.

In claim 52, a wireless communication system, comprising:

wherein the spatial signature vectors provide information with respect to a combination of radios of the first set of radios that are acceptable to be activated in parallel when a radio of

the first set of radios is information communication with a corresponding one of the subscriber stations.

In claim 57, a wireless communication system, comprising:

a plurality of spatial signature vectors setting forth the information for each one of the subscriber stations with respect to the first set of radios, wherein each of the subscriber stations has a spatial signature vector of the plurality of spatial signature vectors associated therewith.

In claim 59, a wireless communication system, comprising:

a plurality of spatial signature vectors setting forth the information for each one of the subscriber stations with respect to the first set of radios, wherein each of the subscriber stations has a spatial signature vector of the plurality of spatial signature vectors associated therewith.

Regarding claim 62, a wireless communication system comprising:

a vector array setting forth a plurality of combinations of radios of the first set of radios that are activated in parallel to provide simultaneous communication links with respect to subscriber stations operable in the service area; and

a channel selection controller dynamically selecting a frequency channel of said first and second frequency channels having a highest channel quality metric associated therewith for use in communicating with a subscriber station.

Regarding claim 64, a wireless communication system comprising:

a vector array setting forth a plurality of combinations of radios of the first set of radios that are activated in parallel to provide simultaneous communication links with respect to subscriber stations operable in the service area; and

a controller selecting a valid frame from frames simultaneously transmitted using the first and second frequency channels.

Regarding claim 65, a wireless communication system comprising:

a vector array setting forth a plurality of combinations of radios of the first set of radios that are activated in parallel to provide simultaneous communication links with respect to subscriber stations operable in the service area; and

a controller deinterleaving a framer from data simultaneously transmitted using the first and second frequency channels.

Regarding claim 66, a wireless communication system comprising:

a vector array setting forth a plurality of combinations of radios of the first set of radios that are activated in parallel to provide simultaneous communication links with respect to subscriber stations operable in the service area.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Publication 2004/0157611 to Smith et al.

US Patent 5,850,596 to Reynolds

US Publication 2002/0186710 to Alvesalo et al.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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